



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/689,656	10/22/2003	Mikhail Kejzelman	003301-054	6495

21839 7590 10/19/2006

BUCHANAN, INGERSOLL & ROONEY PC
POST OFFICE BOX 1404
ALEXANDRIA, VA 22313-1404

EXAMINER

KESSLER, CHRISTOPHER S

ART UNIT	PAPER NUMBER
----------	--------------

1742

DATE MAILED: 10/19/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/689,656

Applicant(s)

KEJZELMAN ET AL.

Examiner

Christopher Kessler

Art Unit

1742

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 April 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 20-30, 34-40 and 48-51 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 20-30, 34-40 and 48-51 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

Status of Claims

1. Responsive to the communication dated 10 April 2006, Claim 20 has been amended, and Claim 31 has been cancelled. Applicant previously canceled claims 1-19, 32-33 and 41-47. Claims 20-30, 34-40 and 48-51 are currently under consideration.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim 49 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

It is common practice in powder metallurgy to lubricate the die before die compaction, and also to use internal lubrication. Nowhere in the applicant's specification does it specifically state that the die compaction takes place without external lubrication. Furthermore, there is no evidence presented that any specific advantage is gained by using no external lubrication.

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 30 is rejected under 35 U.S.C. 112, second paragraph, as lacking antecedent basis for the language of the claim. Claim 30 recites the limitation "the process in claim 22 wherein the graphite is present in an amount of about 0.1 to 1.0%." There is insufficient antecedent basis for this limitation in the claim, as there is no mention of graphite in claim 22 or in claim 20 upon which it depends. The Examiner recommends amending this claim to be dependent upon claim 21.

Claim Rejections - 35 USC § 103

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 20-30, 34-38, 40 and 48-49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ozaki et al (hereafter "Ozaki").

Regarding claim 20, Ozaki et al. discloses an iron powder composition for preparing high density green compacts by compaction that is essentially without fine particles. See Table 1, powder A1, for example. In this powder, more than 70% of the particles are at least 106 μm in size. Less than 2% of the particles are smaller than 150 μm , meaning that less than 2% of the particles are less than 45 μm in size.

Ozaki discloses adding zinc stearate powder to the iron powder for compaction in amounts that fall within the range of about 0.05% and about 0.6% by weight (see col.14, lines 52-60). Ozaki further discloses die compaction of the iron powder at pressures of 1,177 Mpa (see Examples 1-1 and 1-2).

Ozaki does not disclose ejecting the green body from the die. However, the practice of ejecting the compact from the die after pressing would have been obvious to one of ordinary skill in the art, in order to densify the green body by heat treatment, for example.

Regarding claim 21, Ozaki teaches addition of graphite and other elements to iron powder containing fines before compaction, for alloying the powder (see Example 2). It would have been obvious to one of skill in the art at time of invention to add the graphite to create alloys suitable for parts with high mechanical strength, as taught by Ozaki et al. (see Example 2).

Regarding claim 22, Ozaki discloses a process wherein the compaction is performed in a single step (see col. 2, lines 26-29).

Regarding claim 23, Ozaki discloses iron powders in which at least about 50% of the powder consists of particles having a particle size above about 106 μm (see Table 1, powder A1).

Regarding claim 24, Ozaki discloses iron powders in which at least about 60% of the powder consists of particles having a particle size above about 106 μm (see Table 1, powder A1).

Regarding claim 25, Ozaki discloses iron powders in which at least about 70% of the powder consists of particles having a particle size above about 106 μm (see Table 1, powder A1).

Regarding claim 26, Ozaki discloses iron powders in which at least about 50% of the powder consists of particles having a particle size above about 106 μm (see Table 1, powder A15).

Regarding claim 27, Ozaki discloses iron powders in which 50.1% of the particles are 250-1000 μm , and 35.2% of the particles are 180-250 μm (see Table 1, powder A15). The limitation that at least about 60% of the powder consists of particles having a particle size above about 212 μm would be obvious to one of ordinary skill in the art.

Regarding claim 28, Ozaki discloses iron powders in which 50.1% of the particles are 250-1000 μm , and 35.2% of the particles are 180-250 μm (see Table 1, powder A15). The limitation that at least about 70% of the powder consists of particles having a particle size above about 212 μm would be obvious to one of ordinary skill in the art.

Regarding claim 29, Ozaki discloses a maximum particle size of about 1 mm, for the reason that the larger particles will preferentially sit at corners and die walls, resulting in porosity in corresponding areas of the green body. There is no evidence that the limitation of 2 mm as maximum particle size is a critical value (see MPEP §2144.05 IIB). In fact, applicant's specification states that less than 5% of the particles have size of 417 μm (page 3, last paragraph), teaching away from a 2 mm maximum particle size.

Regarding claim 30, Ozaki discloses amounts of graphite which fall within applicant's claimed range of 0.1-1.0% (see Table 6).

Regarding claim 34, Ozaki discloses mixing alloying elements with the iron powder before compaction (see Example 2).

Art Unit: 1742

Regarding claims 35-37, Ozaki discloses compaction at pressure of 1177 Mpa.

Regarding claim 38, Ozaki discloses die compaction to be performed at room temperature (see col. 2, lines 26-29).

Regarding claim 40, Ozaki discloses sintering the green body at temperature of 1250 °C (see Example 2).

Regarding claim 48, Ozaki discloses mixing alloying elements including Ni, Cu and Mo with the iron powder before compaction (see Example 2).

Regarding claim 49, Ozaki discloses the addition of zinc stearate, a commonly used lubricant, to the powder (see Example 1-2). It would have been obvious to one of ordinary skill in the art at time of invention to use the compaction without external lubrication in order to save processing steps.

5. Claims 39, 50 and 51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ozaki et al. in view of Rutz et al.

Regarding claim 39, Ozaki is applied to the claim as stated above.

Ozaki is silent with regard to compaction being performed at elevated temperature.

Rutz et al. discloses compaction being performed at elevated temperature (see claim 1, or col. 1, lines 23-34, for example).

It would have been obvious to one skilled in the art to use compaction at an elevated temperature, as taught by Rutz et al., cited above, to compact the powder

Art Unit: 1742

disclosed in Ozaki et al. in order to improve density and strength at lower compaction pressures, as taught by Rutz, et al (col. 1, lines 23-34).

Regarding claims 50 and 51, Ozaki discloses iron powders synthesized by a water atomization process (see col. 3, lines 12-13).

However, Ozaki is silent with regard to the powder being a completely alloyed steel powder.

Rutz et al. discloses a process for die compaction of an iron based powder, and lists results from compacting Ancorsteel® 4600V powder (see Table 2). Rutz also teaches that the alloying elements of the iron powder are chosen to correspond to desired properties in the final metal part (see col. 3, lines 2-4).

It would have been obvious to one skilled in the art to use the completely alloyed steel as disclosed in Rutz et al., cited above, as the base composition of the iron powder used in the compaction steps disclosed in Ozaki et al. in order to change the properties of the final part, as taught by Rutz et al., cited above.

Response to Arguments

6. Applicant's arguments filed 10 April 2006 have been fully considered but they are not persuasive.

Applicant argues that the combination of the teachings of Kaufman et al. and Rutz et al. do not teach the present invention.

This argument is moot in view of the present grounds for rejection under 35 U.S.C. 103 (a) over Ozaki in light of Rutz et al.

The amendment of claim 1 to include the limitations of previous claim 31 is not sufficient to overcome the obviousness rejection over Ozaki et al. Ozaki discloses addition of a zinc stearate powder to the iron powder in amounts that fall within applicant's claimed range for lubricant added to the powder (see Example 1-2). Further, the powder in the same example is compacted at pressures of 1177 MPa.

Conclusion

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher Kessler whose telephone number is (571) 272-6510. The examiner can normally be reached on Mon-Fri, 9-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1742

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

csk

ROY KING
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700